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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
10/809,174	03/23/2004	Mariappan P. Paranthaman	1323	7770	
24298	7590	02/20/2008	EXAMINER		
UT-Battelle, LLC		VIJAYAKUMAR, KALLAMBELLA M			
Office of Intellectual Property		ART UNIT		PAPER NUMBER	
One Bethal Valley Road		1793			
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Oak Ridge, TN 37831		02/20/2008		PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>
	10/809,174	PARANTHAMAN ET AL.
	<b>Examiner</b>	<b>Art Unit</b>
	KALLAMBELLA VIJAYAKUMAR	1793

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 23 March 2004.
- 2a) This action is **FINAL**.                    2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-51 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) Claim(s) \_\_\_\_\_ is/are allowed.
- 6) Claim(s) 1-13, 15-20, 22-28 and 30-51 is/are rejected.
- 7) Claim(s) 14, 21, 29 and 37 is/are objected to.
- 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All    b) Some \* c) None of:
1. Certified copies of the priority documents have been received.
  2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>03/23/2004</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____ .                        |

#### **DETAILED ACTION**

- Claims 1-51 are currently pending with the application.
- The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609.04(a) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.
- The information disclosure statement (IDS) submitted on 03/23/2004 is in compliance with the provisions of 37 CFR 1.97 and it has been considered by the examiner.
- Acknowledge the granting the petition under 37 CFR 1.102(c), filed on March 23, 2004, to make the above- identified application special based on superconductivity technologies as set forth in M.P.E.P. § 708.02, Section IX in the communication mailed 09/18/2007.

#### ***Claim Objections***

Claim 37 objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim should refer to other claims in alternative only and/or can not depend from any another multiple dependent claim and See MPEP § 608.01(n). Accordingly, the claim 37 has not been further treated on the merits.

#### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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Claim 8, 9, 11, 18, 26 and 36 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 8 recites the limitation "said intermediate layer" in Line-1. There is insufficient antecedent basis for this limitation in the claim.

Claims 9, 11, 18, 26 and 36 provide the composition of an alloy with the formula  $\text{Ir}_{1-x}\text{M}_x$  wherein x- is undefined whereby the claim limitation it is indefinite, a person of ordinary skilled in the art will not be able to ascertain the metes and bounds of this limitation, and will not be able to practice the invention without undue burden of experimentation; and when a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement, a rejection of the claim under 35 U.S.C. 112, second paragraph, would be appropriate. See Morton Int'l, Inc. v. Cardinal Chem. Co., 5 F.3d 1464, 1470, 28 USPQ2d 1190, 1195 (Fed. Cir. 1993).

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

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1. Claims 1-6, 9-12, 15, 17-19, 22, 24, 34-40 and 51 are rejected under 35 U.S.C. 102(b) as being anticipated by Moore et al (WO 01/83855 A1 as evidenced by US 2004/0033904).

Moore et al (US-904) teach a metal article coated with a metal layer having a biaxially textured surface, which process comprises electrodepositing the metal layer on a biaxially textured metal substrate such that the surface of the metal layer has the same texture as that of the substrate (Abstract). The substrates were cube textured metals and alloys based on silver, copper, **nickel** or iron (P-0031) such as NiCr and NiFe (P0015). The buffer layer/intermediate oxygen barrier layer was epitaxially electrodeposited metal or a mixture of metals such as Cr, Ni, Pd, Pt, Ru, Os, Rh, **Ir**, Au or Cu or mixtures thereof (P-0016) and a multiple oxygen barrier layer such as Ru, Os, Rh, **Ir**, Pd. Pt or Au or a mixture thereof (P-0017) between Ni substrate and Ag layer (P-0020-0021, 0034). A typical article configuration comprised two or more buffer/barrier layers formed the template of biaxially textured metallic substrate with a configuration such as Ni/Pt-Pd-Ir/Ag-Ag<sub>2</sub>O/ceramic-CeO<sub>2</sub>-MgO-YSZ/YBCO (P-0003, 0005). The ceramics forming buffer layer were YSZ, MgO, **TiN**, ZrO<sub>2</sub>, **CeO<sub>2</sub>**, **LaAlO<sub>3</sub>** and SrTiO<sub>3</sub> (P-0006). The superconductor layer was deposited by epitaxy (P-0002, 0051-52). The examiner takes an official notice over the claims 9, 11, 18, 26, 36 and 39 in view of coexistence of Ir and PGM metals and its extraction from PGM metals whereby presence of PGM metal impurities in the Ir alloy is anticipated and any amount including trace levels of these elements will meet the limitation of x in these claims (See Los-Alamos National laboratory report on IR, Copyright-2003). All the limitations of the instant claims are met.

The reference is anticipatory.

2. Claims 1-6, 9-12, 15, 17-19, 22, 24, 34-40 and 51 are rejected under 35 U.S.C. 102(e) as being anticipated by Moore et al (US 2004/0033904).

Moore et al (US-904) teach a metal article coated with a metal layer having a biaxially textured surface, which process comprises electrodepositing the metal layer on a biaxially textured metal substrate such that the surface of the metal layer has the same texture as that of the substrate (Abstract). The substrates were cube textured metals and alloys based on silver, copper, **nickel** or iron (P-0031) such as NiCr and NiFe (P0015). The buffer layer/intermediate oxygen barrier layer was epitaxially

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electrodeposited metal or a mixture of metals such as Cr, Ni, Pd, Pt, Ru, Os, Rh, **Ir**, Au or Cu or mixtures thereof (P-0016) and a multiple oxygen barrier layer such as Ru, Os, Rh, **Ir**, Pd, Pt or Au or a mixture thereof (P-0017) between Ni substrate and Ag layer (P-0020-0021, 0034). A typical article configuration comprised two or more buffer/barrier layers formed the template of biaxially textured metallic substrate with a configuration such as Ni/Pt-Pd-Ir/Ag-Ag<sub>2</sub>O/ceramic-CeO<sub>2</sub>-MgO-YSZ/YBCO (P-0003, 0005). The ceramics forming buffer layer were YSZ, MgO, **TiN**, ZrO<sub>2</sub>, **CeO<sub>2</sub>**, **LaAlO<sub>3</sub>** and SrTiO<sub>3</sub> (P-0006). The superconductor layer was deposited by epitaxy (P-0002, 0051-52). The examiner takes an official notice over the claims 9, 11, 18, 26, 36 and 39 in view of coexistence of Ir and PGM metals and its extraction from PGM metals whereby presence of PGM metal impurities in the Ir alloy is anticipated and any amount including trace levels of these elements will meet the limitation of x in these claims (See Los-Alamos National laboratory report on IR, Copyright-2003). All the limitations of the instant claims are met.

The reference is anticipatory.

3. Claims 35-40 and 51 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al (US 2004/0157747).

Chen et al teach the structure of a multilayer article comprising a biaxially textured metallically ordered metallic substrate, depositing on a surface of the substrate a doped cerium oxide, biaxially textured, buffer layer and forming on the buffer layer an HTS film (P-0034). Substrates included base metals such as Ni and noble metal such as Ir and their alloys (P-0035). The buffer layer(s) included CGO, metal oxides such as Sm<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Pr<sub>2</sub>O<sub>3</sub>, CaO, SrO or their mixtures (P-0036) and superconductor layer included YBCO (P-0037). The examiner takes an official notice over the claims 36 and 39 in view of coexistence of Ir and PGM metals and its extraction from PGM metals whereby presence of PGM metal impurities in the Ir alloy is anticipated and any amount including trace levels of these elements will meet the limitation of x in these claims (See Los-Alamos National laboratory report on IR, Copyright-2003). All the limitations of the instant claims are met.

The reference is anticipatory.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 7, 13, 20, 25-28, 30 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore et al (WO 01/83855 A1 as evidenced by US 2004/0033904) in view of Fritzemeier et al (US 6,428,635).

The disclosure on the structure of the multilayer super conductor article as set forth in rejection-1 under 35 USC 102(e) is herein incorporated.

The prior art fails to teach the particular sequence of layers per claims 7, 13 and 20; and the multiple buffer layers per claims 25, 28 and 32-33.

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In the analogous art, Fritzemeier et al teach a super conductor article comprising a biaxially textured Ni-Cu-alloy substrate, a buffer layer system and a YBCO layer (Abstract, Fig 3, 3A and 3B; Cl-2, Ln 41-43). The structure included a substrate 301 of composite 300, for receiving a superconducting oxide coating 303, a buffer layer (or multiple buffer layers) 302 is deposited in an epitaxial process onto the cube-textured alloy substrate 301 (Fig-3). The buffer layer 302 includes a single metal or oxide layer, or can be a multiple layered structure. The multiple layers 304 and 305 (Fig-3A) can include any combination of layers, such as a metal layer 304 with an oxide layer 305 on top, or an oxide layer 304 with another oxide layer 305 on top or, the buffer layer can include three or even more layers (Fig-3B) before deposition of the superconducting layer 303 (Cl-4, Ln 24-43; Cl-6, Ln 41-65). The top and buffer layers included noble metals including Iridium and the oxide buffer layers included stable oxides with a cubic structure such as MgO, Al<sub>2</sub>O<sub>3</sub>, yttria, YSZ, or rare earth oxides such as CeO<sub>2</sub>, Yb<sub>2</sub>O<sub>3</sub> etc. or mixtures of these oxides (Cl-7, Ln 16-26).

It would have been obvious to a person of ordinary skilled in the art formulate the specific layered structure in the structure of superconductor article by Moore et al the per the claims 7, 13 and 20; and/or make multiple layer structure per the claims 25-28, 30 and 32-33 over the teachings of Fritzemeir et al with reasonable expectation of success and predictable results, because Moore et al is suggestive of superconductor article having two or more buffer/barrier layers over biaxially textured Ni alloy substrates (P-0003).

2. Claims 16, 23, 31 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore et al (WO 01/83855 A1 as evidenced by US 2004/0033904) in view of Fritzemeier et al (US 6,428,635) and Goyal et al (US 6,451,450).

The disclosure on the structure of the multilayer super conductor article as set forth in rejection-1 under 35 USC 102(e) and rejection-1 under 35 USC 103(a) are herein incorporated.

The prior art fails to teach the specific buffer layers per the claims.

In the analogous art, Goyal et al teach a laminate article consisting of a metallic-substrate comprising of nickel, copper, iron, aluminum, silver and alloys containing any of the foregoing of, and a biaxially

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textured protective layer over the substrate selected from the group consisting of gold, silver, platinum, palladium, and nickel and alloys containing any of the foregoing and subsequent oxide buffer layer comprising YBCO, CeO<sub>2</sub>, YSZ, LaAlO<sub>3</sub>, SrTiO<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>, RE<sub>2</sub>O<sub>3</sub>, SrRuO<sub>3</sub>, LaNiO<sub>3</sub> and La<sub>2</sub>ZrO<sub>3</sub> deposited over the protective layer.

It would be obvious to a person of ordinary skilled in the art formulate the multilayer superconductor article of Moore and Fritzemeier et al either by substituting a layer or including a layer with the oxide buffer layers of Goyal et al as functional equivalent with reasonable expectation of success and predictable results, because the teachings are in the analogous art of multilayer super conductor article comprising biaxially textured substrate and buffer layers comprising noble metal and oxides.

3. Claims 42-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moore et al (WO 01/83855 A1 as evidenced by US 2004/0033904) in view of Fritzemeier et al (US 6,428,635) and Goyal et al (US 6,451,450) and Chen et al (US 2004/0157747).

The disclosure on the structure of the multilayer super conductor article as set forth in rejection-1 under 35 USC 102(e) and rejections-1-2 under 35 USC 103(a) are herein incorporated.

The prior art fails to teach the Ir substrate per the claim-42 and the structures per the claims 43-50.

In the analogous art, Chen et al teach the structure of a multilayer article comprising a biaxially textured metallically ordered metallic substrate, depositing on a surface of the substrate a doped cerium oxide, biaxially textured, buffer layer and forming on the buffer layer an HTS film (P-0034). Substrates included base metals such as Ni and noble metal such as Ir and their alloys (P-0035). The buffer layer(s) included CGO, metal oxides such as Sm<sub>2</sub>O<sub>3</sub>, Y<sub>2</sub>O<sub>3</sub>, Gd<sub>2</sub>O<sub>3</sub>, Pr<sub>2</sub>O<sub>3</sub>, CaO, SrO or their mixtures (P-0036) and superconductor layer included YBCO (P-0037).

It would be obvious to a person of ordinary skilled in the art formulate the multilayer superconductor article of Moore, Fritzemeier et al and Goyal et al by substituting substrate with biaxially textured Iridium of Chen et al with reasonable expectation of success and predictable results, because the teachings are in the analogous art of multilayer super conductor article comprising biaxially textured substrate wherein

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the species of Ni of prior art is encompassed by the genus of metallic substrates of Chen et al and buffer layers comprising oxides.

### ***Double Patenting***

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-7, 9-13, 15-17, 19-20, 22-24, 35-36 and 38-45 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-6, 8-14, 16-18 of U.S. Patent No. 6,872,988 in view of Moore et al (WO 01/83855 A1 as evidenced by US 2004/0033904) and/or Chen et al (US 2004/0157747). Although the conflicting claims are not identical, they are not patentably distinct from each other because they are drawn to similar structures containing similar components, while the patent differs from the instant claims by not claim a superconducting layer that would be obvious over Moore et al and/or Chen et al (US 2004/0157747).

### ***Allowable Subject Matter***

Claims 14, 21 and 29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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The following is a statement of reasons for the indication of allowable subject matter: The prior art of record neither teaches nor fairly suggest a multilayer article comprising the specific structure and the specific layers in configuration.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kallambella Vijayakumar whose telephone number is 571-272-1324. The examiner can normally be reached on 6.30-4.00 Mon-Thu, 6.30-2.00 Alt Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman can be reached on 571-272-1358. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/K. M. V./  
Examiner, Art Unit 1793  
January 31, 2008.

/Stanley Silverman/  
Supervisory Patent Examiner, Art Unit 1793